



The Sizewell C Project

6.4 Volume 3 Northern Park and Ride Chapter 10 Soils and Agriculture

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Appendices

Appendix 10A: Northern Park and Ride Site: Agricultural Land Classification

10. Soils and Agriculture

10.1 Introduction

10.1.1 This chapter of **Volume 3** of the **Environmental Statement (ES)** (Doc Ref. Book 6) presents an assessment of the potential effects on soils and agriculture arising from the construction, operation and removal and reinstatement of the northern park and ride at Darsham (referred to throughout this volume as the 'proposed development'). This includes an assessment of potential impacts, the significance of effects, the requirements for mitigation and the residual effects.

10.1.2 Detailed descriptions of the northern park and ride site at Darsham (referred to throughout this volume as the 'site'), the proposed development, and the different phases of development are provided in **Chapters 1** and **2** of this volume of the **ES**. A glossary of terms and list of abbreviations used in this chapter is provided in **Volume 1, Appendix 1A** of the **ES**.

10.1.3 This assessment has been informed by data from other assessments, as follows:

- **Chapter 4:** Noise and vibration.
- **Chapter 5:** Air quality.
- **Chapter 7:** Terrestrial ecology and ornithology.
- **Chapter 11:** Geology and land quality.
- **Chapter 12:** Groundwater and surface water.

10.1.4 Furthermore, this assessment has been informed by data presented in the following technical appendix:

- **Appendix 10A:** Northern Park and Ride Site: Agricultural Land Classification (ALC).

10.1.5 This assessment relates to the following key factors:

- the soil types and related ALC¹ grades likely to be affected by the proposed development;

¹ Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use, and Grade 5 is very poor quality land, with severe limitations due to adverse soil characteristics, relief, climate or a combination of these. Grade 3 land is

- the type of farm enterprises and farming, or land management practices present, including any agri-environment schemes²; and
- the possible presence of crop, soil or animal diseases, or noxious weeds, and the risk of spreading such disease or weeds.

10.1.6 The objectives of the assessment are to:

- characterise the baseline environmental conditions for soils, land use and agriculture within the study area;
- identify all soils, land use and agricultural receptors within, and adjacent to, the site that may be affected by the construction, operation and the removal and reinstatement phases of the site;
- assess the effects of the proposed development on soil, land use and agriculture, taking account of temporary land use requirements and site reinstatement;
- specify measures, if appropriate, to mitigate potential significant adverse residual effects on soil, land use and agriculture; and
- determine the residual effects, remaining after additional mitigation.

10.2 Legislation, policy and guidance

10.2.1 **Volume 1, Appendix 6M**, identifies and describes legislation, policy and guidance of relevance to the assessment of the potential agriculture and soil impacts associated with the Sizewell C Project across all **ES** volumes.

10.2.2 This section provides an overview of the specific legislation, policy and guidance of relevance to the assessment of the proposed development.

a) International

10.2.3 There is no international legislation or policies deemed relevant to the assessment of effects on soils and agriculture for this site.

b) National

10.2.4 As stated in **Volume 1, Chapter 3**, the Overarching National Policy Statement (NPS) for Energy (NPS EN-1) (Ref. 10.1) when combined with

subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grades 1, 2 and 3a are defined as best and most versatile (BMV) land.

² Agri-environment schemes are land management practices which protect and enhance the environment, for example planting field margins with food sources for insects and reduced management of hedgerows to provide more habitat for farmland birds.

the NPS for Nuclear Power Generation (NPS EN-6) (Ref. 10.2) provides the primary basis for decisions on applications for nuclear power generation developments. A summary of the relevant NPS EN-1, and NPS EN-6 requirements, together with consideration of how these requirements have been taken into account in the soils and agricultural assessment is provided in **Volume 1, Appendix 6M**.

10.2.5 In summary, these policies require the impacts on soils and Best and Most Versatile (BMV) land to be considered in the assessment, including seeking to minimise impacts on BMV land and use areas of poorer quality land in preference.

10.2.6 Other national policies of relevance to the assessment include:

- The National Planning Policy Framework (NPPF) – this requires planning policies and decisions to recognise the economic, and other benefits of the best and most versatile agricultural land, and of trees and woodland (Ref. 10.3).
- Planning Practice Guidance – this refers to agricultural land and the requirement for consultation with Natural England where there is an impact on BMV land (Ref. 10.4).
- Government’s 25 Year Environment Plan – this includes plans to tackle problems of soil degradation and to enhance our natural capital (which includes soils), with an ambition that by 2030 all of England’s soils should be managed sustainably (Ref. 10.5).
- Safeguarding our Soils: A Strategy for England – this sets out the Government’s aim to protect agricultural soils, particularly where BMV land is present (Ref. 10.6).

10.2.7 The requirements of these, as relevant to the soils and agriculture assessment, are set out in **Volume 1, Appendix 6M**.

c) **Regional**

10.2.8 No regional policies are deemed relevant to the assessment of effects on soils and agriculture for this site.

d) **Local**

10.2.9 Local policies relating to the soils and agriculture assessment include:

- Suffolk Coastal District Council (SCDC) Local Plan Core Strategy and Development Management Policies, published by East Suffolk Council,

(Ref. 10.7) – this makes reference to, where possible, preserving prime agricultural land for food production.

- SCDC Final Draft Local Plan (published by East Suffolk Council) – this highlights the presence of BMV land as a key issue (Ref. 10.8).

10.2.10 The requirements of these, as relevant to the soils and agriculture assessment, are set out in **Volume 1, Appendix 6M**.

i. [Guidance](#)

10.2.11 This assessment has been undertaken in accordance with the following guidance documents:

- Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, section 3, part 11, LA109 Geology and Soils (Ref. 10.9).
- Natural England Technical Information Note 049 (2012) (Ref. 10.10).
- Department for Environment, Food and Rural Affairs (DEFRA) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Ref. 10.11).
- Good Practice Guide for Handling Soils (Ministry of Agriculture, Fisheries and Food (MAFF), 2000) (Ref. 10.12).
- British Standard Specification for Topsoil and Requirements for Use (BS3882:2015) (Ref. 10.13).

10.2.12 The requirements of these, as relevant to the soils and agriculture assessment, are set out in **Volume 1, Appendix 6M**.

10.3 [Methodology](#)

a) [Scope of the assessment](#)

10.3.1 The generic Environmental Impact Assessment (EIA) methodology is detailed in **Volume 1, Chapter 6** of the **ES**.

10.3.2 The full method of assessment for soils and agriculture that has been applied for the Sizewell C Project is included in **Volume 1, Appendix 6M**.

10.3.3 This section provides specific details of the soils and agriculture methodology applied to the assessment of the proposed development.

10.3.4 The scope of this assessment has been established through a formal EIA scoping process undertaken with the planning inspectorate. A request for an EIA scoping opinion was initially issued to the planning inspectorate in

2014, with an updated request issued in 2019, see **Volume 1, Appendix 6A**.

10.3.5 Comments raised in the EIA scoping opinion received in 2014 and 2019 have been taken into account in the development of the assessment methodology. These are detailed in **Volume 1, Appendices 6A to 6C**.

b) **Consultation**

10.3.6 The scope of the assessment has been informed by specific consultation and engagement with statutory consultees throughout the design and assessment process. For the soils and agriculture assessment, this has been undertaken on a project-wide basis, and details are included in **Volume 1, Appendix 6M**, where it was confirmed the approach would follow the published guidelines. No consultation with statutory consultees in relation to the scope of the soils and agriculture assessment has been undertaken with specific regards to the site.

c) **Study area**

10.3.7 The study area for the soils and agriculture assessment includes the land required for construction, operation and removal and reinstatement phases of the proposed development. The location and extent of the site is described in **Chapter 1** of this volume.

10.3.8 In addition, the assessment of impacts on farm viability takes account of the extent of each affected land holding, so the impact can be considered in the context of the holding.

10.3.9 The site is approximately 27.9 hectares (ha) in size, and is located to the west of the village of Darsham and the A12, to the east of the East Suffolk line and to the north of Darsham railway station. Approximately 26.3ha of this is agricultural land. The remainder of the site comprises a section of the A12, and a hard-surfaced farm track.

d) **Assessment scenarios**

10.3.10 The assessment of effects on soils and agriculture includes the assessment of the construction, operation, and removal and reinstatement phases of the proposed development, rather than specific assessment years.

10.3.11 For the purposes of this assessment, effects on BMV land and land holdings are considered to occur during the construction phase and would last until the completion of the removal and reinstatement phase when the land would be returned to agricultural use.

e) **Assessment criteria**

10.3.12 As described in **Volume 1, Chapter 6**, the EIA methodology considers whether impacts of the proposed development would have an effect on any resources or receptors. Assessments broadly consider the value or sensitivity of resources and receptors that could be affected, and the magnitude of impacts in order to classify effects.

10.3.13 A detailed description of the assessment methodology used to assess the potential effects on soils and agriculture for the proposed development is provided in **Volume 1, Appendix 6M**. A summary of the assessment criteria used in this assessment is presented in the following sub-sections.

i. **Sensitivity**

10.3.14 The approach to assigning levels of sensitivity to receptors is summarised in **Table 10.1**.

Table 10.1: Assessment of the value or sensitivity of receptors for soils and agriculture.

Value and/or Sensitivity.	Description
High	<ul style="list-style-type: none"> Grade 1, 2 and 3a land (i.e. BMV land). Irrigated agriculture. Stock animals. Higher level agri-environment schemes. Soils with low or no wetness limitation affecting workability (wetness class I or II), where drought is not also a limitation. Soils with a high susceptibility to structural damage and soil erosion throughout the year, including heavily textured, poorly structured soils.
Medium	<ul style="list-style-type: none"> Grade 3b land. Non-irrigated agriculture. Entry level agri-environment schemes. Soils with low wetness limitation affecting workability (wetness class II), where drought is not also a limitation. Soils with some seasonal susceptibility to structural damage and soil erosion.
Low	<ul style="list-style-type: none"> Grade 4 land. Arable or grassland areas. Soils with moderate wetness limitation affecting workability (wetness class III or IV). Soils with medium to coarse textures and some resistance to structural damage for most of the year.
Very low.	<ul style="list-style-type: none"> Grade 5 land. Soils with high wetness limitation affecting workability (wetness class V or VI).

	<ul style="list-style-type: none"> • Soils in which susceptibility to drought is a limitation to crop growth. • Course textured and stony soils with little potential for structural damage.
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ii. Magnitude

10.3.15 The magnitude of impact is based on the consequences the proposed development would have upon soils and agricultural receptors. The presence of BMV land is a key factor in the consideration of the sustainability of development proposals as set out in the NPPF (Ref. 10.3). The criteria for the assessment of magnitude are shown in **Table 10.2**.

Table 10.2: Assessment of magnitude of impact on soils and agriculture.

Magnitude	Criteria
High	<ul style="list-style-type: none"> • Permanent or long-term loss or degradation of over 50ha of BMV land, or entire regional resource of BMV land (ALC Grades 1, 2, 3a). • Loss of >20% of farmed land associated with an agricultural farm holding. • Permanent loss of entire area of land under agri-environment or woodland grant scheme. • No access possible to severed land. • Existing land use across land holding would not be able to continue.
Medium	<ul style="list-style-type: none"> • Permanent or long-term loss or degradation of 20–50ha of BMV land, or large proportion of regional resource of BMV land. • Loss of >10– 20% of farmed land associated with an agricultural farm holding. • Long-term, reversible, loss of entire area or majority of land under agri-environment or woodland grant scheme. • Access possible to severed land via the public highway. • Existing land use across land holding would be able to continue, but with major changes such as loss of yield, additional land management, or increased use of fertilisers and herbicides.
Low	<ul style="list-style-type: none"> • Permanent or long-term loss or degradation of 10–20ha of BMV land, or small proportion of regional resource of BMV land. • Loss of >5–10% of farmed land associated with an agricultural farm holding. • Short- to medium-term reversible loss, or permanent loss of small areas, of land area under agri-environment or woodland grant scheme. • Access possible to severed land via private ways. • Existing land use across land holding would be able to continue, but with some changes such as loss of yield, additional land management, or increased use of fertilisers and herbicides.
Very low.	<ul style="list-style-type: none"> • Permanent or long-term loss or degradation of <10ha of BMV land. • Loss of <5% of farmed land associated with an agricultural farm holding. • No severance. • Short-term impacts to receptors with no impact on integrity. No material changes to existing land use.

10.3.16 For the purposes of this assessment long-term is considered to include the timeframe of the construction, operation, and removal and reinstatement phases of the proposed development.

iii. Effect definitions

10.3.17 The definitions of effect for agriculture and soils are shown in **Table 10.3**.

Table 10.3: Classification of effects.

		Value/Sensitivity of Receptor.			
		Very low.	Low	Medium	High
Magnitude	Very low.	Negligible	Negligible	Minor	Minor
	Low	Negligible	Minor	Minor	Moderate
	Medium	Minor	Minor	Moderate	Major
	High	Minor	Moderate	Major	Major

10.3.18 Following the classification of an effect as presented in **Table 10.3**, a clear statement is made as to whether the effect is 'significant' or 'not significant'. As a general rule, major and moderate effects are considered to be significant, and minor and negligible effects are considered to be not significant. However, professional judgement is also applied, where appropriate.

f) Assessment methodology

i. Establishing the baseline

10.3.19 The principal agricultural and related resources are characterised by the quality of the agricultural land (i.e. the land grade according to the ALC system) and type of land use (e.g. arable land, presence of livestock, etc.) including any diversified activities on farms (e.g. farm shops).

10.3.20 Soil and ALC surveys were undertaken in accordance with published guidelines (Ref. 10.14). Detailed ALC surveys were undertaken in August and October 2016 and May 2019, examining soil properties to a depth of up to 1.2 metres below ground level (mbgl) where possible at 28 locations, see **Appendix 10A**.

10.3.21 Soil physical characteristics were recorded so that factors such as soil texture, structure, depth and stoniness could be assessed in terms of any limitation they pose to agricultural productivity. Site characteristics, such as micro-relief (topographical changes over short distances) and flood risk, and climate were also assessed in terms of potential limitations they may pose to agricultural productivity.

10.3.22 In addition, the existing landowner for White House Farm was interviewed on the 16 November 2016. The question pro-forma used in the interview is presented in **Volume 1, Appendix 6M**.

ii. [Assessment](#)

10.3.23 The assessment of effects on soils and agriculture includes the following steps:

- Establishing the baseline environmental conditions for soils, land use and agriculture within the study area and identifying relevant receptors.
- Assessing the likely significant effects of the proposed development on soil, land use and agriculture, taking account of temporary and permanent land use requirements and site restoration.
- Specifying measures, if appropriate, to mitigate potential significant adverse effects on soil, land use and agriculture.
- Determining the residual effects remaining after additional mitigation.

g) [Assumptions and limitations](#)

10.3.24 No assumptions or limitations have been identified in relation to agricultural land quality.

10.3.25 Information on land use is based on information publicly available, and as provided by landowners.

10.4 [Baseline environment](#)

10.4.1 This section presents a description of the baseline environment within the site and the surrounding area.

10.4.2 Further detail of the agricultural land quality at the site is presented in **Appendix 10A**.

a) [Current baseline](#)

i. [Geology](#)

10.4.3 The site is underlain by bedrock geology within the Crag Group (quaternary shallow-water marine and estuarine sands, gravels, silts and clays), with an overlying drift deposit of superficial diamicton of the Lowestoft Formation (Ref. 10.15).

10.4.4 A full description of the geological characteristics of the site is provided in the geology and land quality (**Chapter 11**) and groundwater and surface water (**Chapter 12**) assessments of this volume.

ii. Topography and drainage

10.4.5 Land within the site is gently sloping down to the south and east, levelling out on the higher ground to the north-east at approximately 30m Above Ordnance Datum. Gradient and micro topography do not limit ALC Grade within the site based on the ALC criteria.

10.4.6 An unnamed watercourse originates in the east of Martins Farm, approximately 275m to the north-west of the site. The watercourse crosses the East Suffolk line to the south of Willow Marsh Lane crossing, and flows southwards along the western boundary of the site. The channel crosses back beneath the East Suffolk line to the south of Little Nursery Wood and flows to the west of Darsham railway station and ultimately joins the Minsmere River approximately 1.2km south east of the site. This watercourse receives surface water drainage from the site.

10.4.7 There is no evidence that flood risk limits ALC grade at any part of the site. The site is located in Flood Zone 1 and has a low risk of flooding from rivers or the sea. However, two cases of highways flooding have been recorded immediately south of the site near Darsham railway station. Further details of flood risk are presented in **Chapter 12** of this volume and the **Northern Park and Ride Flood Risk Assessment** (Doc Ref. 5.3).

10.4.8 The site is quite low lying so achieving adequate fall for field drainage may be problematic.

iii. Climate

10.4.9 The main parameters used in the assessment of an overall climatic limitation are presented in **Appendix 10A**. These specifically refer to annual average rainfall as a measure of overall wetness, and accumulated temperature over the growing season as a measure of the warmth in the growing season. The site is considered to have both relatively low rainfall, and a long growing season, and thus climate does not impose an overall limitation on ALC grade at this site.

10.4.10 Climate has an important influence on the interactive limitations of soil wetness and soil droughtiness. The relatively low rainfall, and long growing season will act to decrease the severity of any potential soil wetness limitation (i.e. reducing the potential for waterlogging to occur which may restrict plant rooting and the ability of the land to be managed). However, these attributes increase the severity of any potential soil droughtiness limitation (i.e. reduced availability of water for plant uptake).

iv. Soil types

10.4.11 The site comprises slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils (Ref. 10.16), see **Figure 10.1**. These are described as belonging to the Ragdale association³. Drainage is described as being impeded, usually with mottling (representing the influence of waterlogging) within 40 centimetres of the soil surface. Land covered by such soils generally being under grass production or some arable production.

v. Agricultural land quality and classification

10.4.12 Published ALC maps (Ref. 10.17) show the site to be Grade 3 with the potential for some Grade 2 land in the most southern part of the site (**Figure 10.2**). These maps are published at a scale of 1:250,000 and are generally considered to be of value for strategic land use planning purposes and not site-specific assessments, although they do provide a guide as to the likely land grades. It should also be noted that these maps do not distinguish between the Sub-grades 3a and 3b.

10.4.13 Since the publication of the Provisional ALC, certain areas of the country have been surveyed in greater detail. However, there are no detailed ALC maps available for this site. As such, detailed ALC surveys were undertaken on the agricultural land within the site in August 2016, October 2016 and May 2019. At the time of the ALC surveys the site was under arable production, comprising wheat with some areas of fallow. Full details of the agricultural land quality at the site are presented in **Appendix 10A**.

10.4.14 **Figure 10.3** illustrates the distribution of ALC grades across the site, determined by the ALC surveys. The majority of the agricultural land comprised Grades 3a (21.8ha), and 3b (4.5ha), with a small area (1.6ha) of non-agricultural land.

10.4.15 Approximately 78% of the site comprises land which falls into a BMV land category (i.e. Grades 1, 2 and 3a).

10.4.16 The ALC grade distribution and the corresponding percentages, are shown in **Table 10.4**.

Table 10.4: ALC grade distribution.

ALC Grade.	Area (ha).	Area (%).
1	0	0
2	0	0

³ A soil association represents a group of soil types which are typically found occurring together in the landscape.

ALC Grade.	Area (ha).	Area (%).
3a	21.8	78.14
3b	4.5	16.13
4	0	0
5	0	0
Non-agricultural.	1.6	5.73
Total	27.9	100

10.4.17 Grade 3a land comprises soils with a number of key characteristics. There are small areas of land with medium textured topsoil over a light textured subsoil. This land is limited to Grade 3a by soil droughtiness. The majority of the land falling within Grade 3a has a medium textured non-calcareous topsoil over a slowly permeable heavy textured subsoil. This land is occasionally waterlogged (Wetness Class III) and limited to Grade 3a by both soil wetness and soil droughtiness. Some soil profiles are present with a calcareous heavy textured topsoil, also limited to Grade 3a by soil wetness and droughtiness.

10.4.18 Grade 3b land comprises soils with a heavy textured and non-calcareous topsoil above a heavy textured and slowly permeable subsoil. As for the Grade 3a land the land is occasionally wet (Wetness Class III), but has a more severe soil wetness limitation as the higher clay content of the topsoil increases the vulnerability to structural damage.

vi. Land use and holding information

10.4.19 The agricultural land (approximately 26.3ha) on the site is owned by one farm holding; an arable enterprise which occupies approximately 230ha.

10.4.20 Cropping at the site is typically arable combinable crops with beans and sugar beet as additional break crops. This rotation is in common with the rest of the farm's arable land.

10.4.21 The site does not have access to irrigation water. Field drains outfall to the west along the East Suffolk line.

10.4.22 The land at the site is not stock proof and is not serviced by drinking troughs.

10.4.23 The site has hedges, ditches and field corners managed under entry level stewardship (**Figure 10.4**). It is not organic accredited and none of the land within the site is under a woodland or forestry scheme (**Figure 10.5**).

vii. Future baseline

- 10.4.24 It is considered unlikely that the land quality baseline conditions would change. The grade of agricultural land is determined predominantly by the soil's physical characteristics (in particular texture and related structure) which would not change.
- 10.4.25 Whilst climate change predictions indicate increased temperatures which could result in increased drought, the soils which are light textured are already limited by droughtiness. Where the soils are relatively heavy (in terms of texture) they have a good capacity to hold water for crops to access. Overall, in the timeframe of the construction, operation and removal and reinstatement of the proposed development, it is considered there would be no change in the baseline conditions.
- 10.4.26 There are no committed development(s) or forecasted changes that would materially alter the baseline conditions during the construction, operation and removal and reinstatement phases of the proposed development. The consented development of a hotel immediately south of the A12 would not alter the baseline conditions at the site.

10.5 Environmental design and mitigation

- 10.5.1 As detailed in **Volume 1, Chapter 6**, a number of primary mitigation measures have been identified through the iterative EIA process, and have been incorporated into the design and construction planning of the proposed development. Tertiary mitigation measures are legal requirements or are standard practices that will be implemented as part of the proposed development.
- 10.5.2 The assessment of likely significant effects of the proposed development assumes that primary and tertiary mitigation measures are in place. These measures are summarised in this section so that it is clear where and why these measures have been included, and the way in which they have contributed to the management and reduction of environmental effects.
- a) Primary mitigation
- 10.5.3 Primary mitigation is often referred to as 'embedded mitigation' and includes modifications to the location or design to mitigate impacts; these measures become an inherent part of the proposed development.
- 10.5.4 As part of the design process, the site layout in relation to temporary land requirements has been optimised to reduce the overall land take.

10.5.5 A separate agricultural track, to the west side of the proposed roundabout, north of Willow Marsh Lane, has been provided to retain access to fields. Access to White House Farm is also retained.

b) Tertiary mitigation

10.5.6 Tertiary mitigation will be required regardless of any EIA assessment, as it is imposed, for example, as a result of legislative requirements and/or standard sectoral practices.

10.5.7 The sustainable re-use of the soil resource would be undertaken in line with the Construction Code of Practice for the Sustainable Use of Soil on Construction Sites and the MAFF Good Practice Guide for Soil Handling.

10.5.8 An outline **Soil Management Plan** has been developed (see **Volume 2, Appendix 17C** of the **ES**). This would contain information on handling methods and measures which would be implemented including (but not limited to):

- development of a Soil Resources Plan by the contractor, which would include detail on existing soil information, proposed storage locations and management measures;
- ensuring soils are stripped and handled in the driest condition possible;
- ensuring different soil resources (in particular topsoil and subsoil) are stripped and stored separately;
- protection of stockpiles from erosion through establishment of a grass cover and from tracking over through appropriate signage and/or fencing;
- confining vehicle movements to defined haul routes until all the soil resource has been stripped; and
- ensuring the physical condition of the replaced soil profile to at least 1.2mbgl is sufficient for the post-reinstatement agricultural use.

10.5.9 The requirements of the Outline Soil Management Plan are included within the **Code of Construction Practice (CoCP)** (Doc Ref. 8.11).

10.5.10 All soils would be stored a minimum of 10m away from watercourses (or potential pathways to watercourses), and any potentially contaminated soil would be stored on an impermeable surface and covered to reduce leachate generation and potential migration to surface waters.

- 10.5.11 Industry standard measures would be put in place to control pollution, including from fuel or chemical stores, silt-laden run-off or dust as detailed in the air quality (**Chapter 5**), geology and land quality (**Chapter 11**) and groundwater and surface water (**Chapter 12**) assessments of this volume.
- 10.5.12 Toolbox talks would be used to inform all those working on the site of the requirements for soil handling, and minimisation of disturbance to agricultural activities to minimise potential impacts on the remainder of the landholding, and on neighbouring landholdings during the construction phase.
- 10.5.13 All security fencing around the proposed development would be sufficient to resist damage by livestock from adjacent land and would be regularly checked and maintained in a suitable condition. Any damage to boundary fencing would be repaired.
- 10.5.14 Measures contained in relevant Defra and Environment Agency best practice guidance on the control and removal of invasive weed species (Ref. 10.18) would be implemented where appropriate, such as through the appropriate use of herbicides or removal/burial of plant materials. These are detailed in the **CoCP** (Doc Ref. 8.11).
- 10.5.15 Should animal bones be discovered which may indicate a potential burial site, works would cease, and advice would be sought from the Animal Health Regional Office on how to proceed, relevant to the origin and age of the materials found.
- 10.5.16 All movement of plant and vehicles between fields would cease in the event of a disease outbreak. Advice and guidance from Defra would be followed to minimise the biosecurity risk associated with the continuation of works.

10.6 Assessment

a) Introduction

- 10.6.1 This section presents the findings of the soils and agriculture assessment for the construction, operation, and removal and reinstatement of the proposed development.
- 10.6.2 This section identifies any likely significant effects that are predicted to occur, and **section 10.7** highlights any secondary mitigation and monitoring measures that are proposed to minimise any adverse significant effects (if required).

b) Construction

i. Agricultural land

10.6.3 During construction, the proposed development would result in the temporary, long-term loss of 26.3ha of land from primary agricultural productivity. Approximately 21.8ha (78.14%) of this land is of Grade 3a value, which is considered to be BMV land. The remaining agricultural land temporarily lost is Grades 3b land and land in non-agricultural use.

10.6.4 The land described as Grade 3a land is a receptor of high value. The magnitude of this impact would be assessed as **medium**. Therefore, this is considered to be a **major adverse** effect which would be **significant**.

ii. Land holding

10.6.5 Whilst the land holding is arable it is covered by an entry level agri-environment agreement and so would be considered to be a receptor of **medium** value.

10.6.6 Approximately 26.3ha of land from this holding would be required on a temporary, long-term basis. The land would be retained throughout the construction, operation, and removal and reinstatement phases, and would be returned and restored to the holding at the culmination of the removal and reinstatement phase.

10.6.7 Therefore, there would be temporary, long-term impacts on the agricultural enterprise resulting from a long-term loss of land available for production.

10.6.8 Approximately 11.4% of the total landholding would be temporarily lost as a result of the construction of the proposed development, it is considered that existing land use across the rest of the holding would be able to continue but with adjustments required relating to the management required for any replacement land taken. The impact during construction up to the completion of the removal and reinstatement phase is therefore assessed as being of **medium** magnitude which would be a **moderate adverse** effect and **significant**.

10.6.9 There would be a temporary loss of a very small area (in terms of the regional resource of approximately 70,000ha (Ref. 10.17)) of land under an entry level agri-environment scheme which would be considered to be of very low magnitude, which would be a minor adverse effect and **not significant**.

10.6.10 There are no severance impacts associated with the proposed development.

iii. Inter-relationship effects

- 10.6.11 There are anticipated to be inter-relationship effects between geology and land quality; landscape; noise; air quality and groundwater and surface water in relation to potential receptors which could be impacted by ground contamination, poor ground conditions resulting from soil handling and noise or dust affecting adjacent land holdings.
- 10.6.12 There is the potential for effects on agricultural land to increase due to effects arising on land quality as construction activities could result in ground contamination, soil erosion and silt-laden runoff affecting land outside the site boundary or soils required for reinstatement of land required temporarily. The **CoCP** outlines measures which would be used to control runoff, erosion and pollution. The assessment presented in **Chapter 11** of this volume determined that the risk would be low or very low and as such it is considered there is limited potential for effects arising from geology and land quality to increase the effects reported on agricultural land.
- 10.6.13 In relation to landscape, the ability to create and maintain elements of landscape planting would require soils with appropriate characteristics. The Soil Management Plan sets out how soils would be stripped, stockpiled and re-used to ensure they are suitable for the required end use. These are established methods, based on published guidance, and as such it is considered there is limited potential for inter-relationship effects with landscape.
- 10.6.14 During the construction phase there is the potential for effects on agricultural land to increase as result of noise generated by construction activities. The exact construction working methods would not be decided until after approval of the development consent application and as such precise details of mitigation measures have been defined. However, the **CoCP** includes a range of measures which could be used to reduce impacts from noise on adjacent receptors, which would limit potential impacts on any livestock present, and as such it is considered there is limited potential for inter-relationship effects with noise and vibration.
- 10.6.15 There is the potential for the effects on agricultural land to increase due to effects arising on air quality as construction activities would result in the emission of dust which could be deposited on adjacent agricultural land surrounding the site. This has the potential to result in smothering of vegetation and soil contamination, impacting agricultural productivity. A dust impact assessment was undertaken for the site (see **Appendix 5A**) which identified dust generating activities during the earthworks phase. The risk of dust impacts was determined to be negligible. The **CoCP** outlines the control measures that would be applied on site to reduce the

risk of dust impacts such that the residual effect on air quality is considered to be negligible. On this basis, it is considered there is limited potential for effects arising from air quality to increase the effects reported on agricultural land quality.

- 10.6.16 Changes to surface and groundwater flows as a result of construction activities has the potential to increase effects on agricultural land and soils required for reinstatement of land and landscape planting areas (for example altered groundwater regime or flood risk). The **CoCP** outlines measures to be implemented to reduce the risk of hydrological or hydrogeological changes which could affect agricultural land such that the effects are considered to be minor adverse or negligible. The assessment presented in **Chapter 12** of this volume and the **Northern Park and Ride Flood Risk Assessment** (Doc Ref. 5.3) determined that there was no flood risk to surrounding areas and as such it is considered that there is limited potential for effects arising from groundwater and surface water to increase the effects reported on agricultural quality.

c) Operation

- 10.6.17 During operation of the proposed development, the land needed for construction would still be required. No additional land would be required beyond that reported for the construction phase, and no further effects on BMV or agricultural land holdings are anticipated.
- 10.6.18 There is the potential for invasive weed species to grow within the site. However, this would be controlled using an appropriate management regime that would remove weed growth that might threaten adjoining agricultural land. The impact during operation, on a receptor of low sensitivity, is therefore assessed as being of low magnitude which would be a minor adverse effect and **not significant**.

i. Inter-relationship effects

- 10.6.19 There are anticipated to be inter-relationship effects between noise; air quality and groundwater and surface water in relation to potential receptors which could be impacted by noise, dust or pollution incidents affecting adjacent land holdings. Potential impacts would include the contamination of soils, disturbance (noise) and dust. However, given the mitigation measures proposed in relation to these disciplines it is expected that there would be only minor inter-relationship effects (**not significant**).

d) Removal and reinstatement

- 10.6.20 Once the need for the facility has ceased, the buildings and associated infrastructure would be removed, with the re-use of building modules and materials maximised.

10.6.21 When the site has been cleared, the area would be reinstated for agricultural use in accordance with the Soil Management Plan (see **Volume 2, Appendix 17C**).

10.6.22 The reinstatement of the land itself would be considered to be an impact of very low magnitude, and of minor effect relative to the baseline, and is considered **not significant**.

i. Inter-relationship effects

10.6.23 There are anticipated to be inter-relationship effects similar to those identified during the construction phase.

10.7 Mitigation and monitoring

a) Introduction

10.7.1 Where possible, mitigation measures have been proposed where a significant effect is predicted to occur. Primary and tertiary mitigation measures, which have been accounted for as part of the assessment, are summarised in **section 10.5** of this chapter. Where reasonably practicable, secondary mitigation measures have been proposed.

10.7.2 This section describes the proposed secondary mitigation measures for the soils and agriculture.

b) Mitigation

10.7.3 There are no mitigation measures available for the permanent loss of BMV land associated with the proposed development which is assessed as a major adverse effect. However, whilst a long-term effect, it is temporary, and the land would be returned to agriculture following the removal and reinstatement phase the overall effects are considered to be **not significant**.

10.7.4 No secondary mitigation or monitoring measures have therefore been identified as being required for the proposed development in relation to the loss of BMV land.

10.7.5 Further consultation with the land owner will be undertaken to reduce the impacts on the farm business, as far as practicable, especially during the construction phase. This will include agreement of assurances and obligations that SZC Co. will accept upon entering the land and compensation, where applicable.

10.7.6 It is considered that this would reduce the magnitude of impact to **low**, which would be a **minor adverse** effect and **not significant**.

10.8 Residual effects

10.8.1 The following tables (**Table 10.5**, **Table 10.6** and **Table 10.7**) present a summary of the residual effects identified through the soils and agriculture assessment. They identify the receptor(s) likely to be impacted, the level of effect, and where the effect is deemed to be significant, the tables include the mitigation proposed and the resulting residual effect.

10.8.2 As stated in **section 10.7** any significant effects to BMV land would be reduced to not significant on completion of the removal and reinstatement phase.

Table 10.5: Summary of effects for the construction phase.

Receptor	Impact	Primary or Tertiary Mitigation.	Assessment of Effects.	Additional Mitigation.	Residual Effects.
BMV land.	Long-term, temporary loss of approximately 21.8ha of Grade 3a land.	None available – noting that the land would be fully restored to agriculture post-operation. Soil handling, storage and re-use would be detailed in a Soil Management Plan to ensure the soils are fit for purpose on reinstatement of the land.	Major adverse (significant) .	None proposed.	Major adverse (significant) .
Land holding.	Long-term, temporary loss of 26.3ha of agricultural land (under entry level agri-environment scheme), and potential disruption to ongoing activities.	Minimisation of disruption, or effects to adjacent land.	Moderate adverse (not significant) .	Impacts on the farm business resulting from the loss of agricultural land from production would be addressed, as far as practicable, directly with the landowner.	Minor adverse (not significant) .
Land under entry level agri-environment scheme.	Long-term temporary loss of small area of land under entry level agri-	Optimisation of scheme to minimise land take.	Minor adverse (not significant) .	None proposed.	Minor adverse (not significant) .

Receptor	Impact	Primary Tertiary Mitigation.	or	Assessment of Effects.	Additional Mitigation.	Residual Effects.
	environment scheme					

Table 10.6: Summary of effects for the operational phase.

Receptor	Impact	Primary Tertiary Mitigation.	or	Assessment of Effects.	Additional Mitigation.	Residual Effects.
Land holding.	Constraints to land use due to weed growth.	General good maintenance of the site.		Minor adverse (not significant).	Appropriate weed management as required.	Minor adverse

Table 10.7: Summary of effects for the removal and reinstatement phase

Receptor	Impact	Primary tertiary mitigation.	or	Assessment of effects.	Additional mitigation.	Residual effects.
BMV land.	Reinstatement of soils.	Soil handling, storage and re-use would be detailed in a soil management plan to ensure the soils are reinstated to the original land grade.		Negligible (not significant).	None	Negligible (not significant).
Land holdings.	Return of land to agricultural use.	Soil handling, storage and re-use would be detailed in a soil management plan to ensure the soils are fit for purpose on reinstatement of the land.		Negligible (not significant).	None	Negligible (not significant).

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